

IN THE CLAIMS:

Replace claims 1-20 and 22-41 as filed with amended claims 1-20 and 22-41. Cancel claim 21. Add new claims 42-53.

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1. (Amended) A method for monitoring the formation of a coating on a single particle, comprising the steps of:
 - (a) arranging the particle at a given spatial location;
 - (b) forming the coating on the particle; and
 - (c) performing a spectroscopic measurement on the coating while the coating is being formed on the particle to obtain a measurement value of at least one principal parameter related to the coating.
 2. (Amended) The method as set forth in claim 1, wherein the spectrometric measurement is performed continuously during at least part of the coating formation step to generate a sequence of measurement values of the principal parameter.
 3. (Amended) The method as set forth in claim 1, wherein the step of arranging the particle at the given spatial location comprises fluidizing the particle on an upwardly directed gas flow.
 4. (Amended) The method as set forth in claim 3, wherein the coating formation comprises generating a single droplet of a coating fluid, and bringing the droplet to impinge upon the particle.
 5. (Amended) The method as set forth in claim 4, wherein the droplet upon generation is moved into and allowed to follow the upwardly directed gas flow to the particle.
 6. (Amended) The method as set forth in claim 4, wherein the step of generating a single droplet is repeated, thereby forming at least one stream of droplets which sequentially impinge upon the particle.
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7. (Amended) The method as set forth in claim 1, further comprising the steps of:
monitoring at least one control parameter related to the particle or its environment; and
identifying a functional relationship between the control parameter and the principal parameter.
8. (Amended) The method as set forth in claim 7, further comprising the step of generating an
aggregate model for prediction of the influence of the control parameter on the principal
parameter for a large number of particles based on the functional relationship for the single
particle.
9. (Amended) The method as set forth in claim 7, further comprising the step of adjusting the
control parameter at least partly on the basis of the measurement value.
10. (Amended) The method as set forth in claim 3, further comprising the steps of:
a) monitoring at least one control parameter related to the particle or its environment; and
b) identifying a functional relationship between the control parameter and the principal
parameter,
wherein the control parameter comprises a property of the gas flow.
11. (Amended) The method as set forth in claim 7, wherein the control parameter comprises a
property of the particle.
12. (Amended) The method as set forth in claim 4, further comprising the steps of:
monitoring at least one control parameter related to the particle or its environment; and
identifying a functional relationship between the control parameter and the principal parameter,
wherein the control parameter comprises a property of the droplet.
13. (Amended) The method as set forth in claim 4, further comprising the steps of:
monitoring at least one control parameter related to the particle or its environment; and
identifying a functional relationship between the control parameter and the principal parameter,
wherein the control parameter comprises the duration of a wetting period during the coating
formation step.

14. (Amended) The method as set forth in claim 4, further comprising the steps of: monitoring at least one control parameter related to the particle or its environment; and identifying a functional relationship between the control parameter and the principal parameter, wherein the control parameter comprises the duration of a drying period during the coating formation step.

15. (Amended) The method as set forth in claim 1, wherein the step of obtaining the measurement value comprises:

- c1) generating a sample vector of measurement data from the spectrometric measurement; and
- c2) condensing the measurement data into the measurement value of the principal parameter.

16. (Amended) The method as set forth in any one of claims 1-15 and 42-47, wherein the spectrometric measurement is performed by means of near-infrared spectrometry.

17. (Amended) The method as set forth in any one of claims 1-15 and 42-47, wherein the spectrometric measurement is performed by means of a spectrometric method based on Raman scattering.

18. (Amended) The method as set forth in any one of claims 1-15 and 42-47, wherein the spectrometric measurement is performed by means of a spectrometric method based on absorption in the UV, visible, or infrared (IR) wavelength region, or luminescence or fluorescence emission.

19. (Amended) The method as set forth in any one of claims 1-15 and 42-47, wherein the spectrometric measurement is performed by means of imaging spectrometry.

20. (Amended) The method as set forth in any one of claims 1-15 and 42-47, wherein the particle is a pharmaceutical product.

22. (Amended) A method for controlling the coating process of a batch of particles, comprising the steps of:

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- a) monitoring the coating formation according to claim 2;
 - b) using the sequence of measurement values of the principal parameter as a sequence of reference values in the control; and
 - c) obtaining a corresponding spectroscopic measurement on the batch of particles to provide a sequence of actual values for the control.


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23. (Amended) A method for controlling the coating process of a batch of particles, comprising the steps of:

- a) monitoring the coating formation according any one of claims 1-15 and 42-47;
- b) identifying a functional relationship between at least one principal parameter and at least one simultaneously-monitored control parameter, wherein the control parameter is related to an environment of a single particle of the batch;
- c) selecting one or more control parameters, based on the functional relationship, to represent one or more of the principal parameters;
- d) determining a desired sequence of values of the selected control parameter(s) for the single particle; and
- e) controlling the coating process of the batch of particles based on the desired sequence of selected control parameter values.

24. (Amended) An apparatus for monitoring the formation of a coating on a single particle comprising: means for arranging the particle at a given spatial location; a fluid supply unit for applying a coating fluid to the particle to form a coating; and a measurement unit which performs a spectrometric measurement on the coating during formation thereof, and derives a measurement value of at least one principal parameter related to the coating.

25. (Amended) The apparatus as set forth in claim 24, wherein the measurement unit continuously performs the spectrometric measurement and thereby generates a sequence of measurement values of the principal parameter.




26. (Amended) The apparatus as set forth in claim 24, wherein the particle arranging means comprises a flow unit which generates a fluidizing gas flow upon which the particle is fluidized.

27. (Amended) The apparatus as set forth in claim 26, further comprising a chamber in which the coating is formed on the particle, wherein the flow unit provides a shielding gas inside the chamber intermediate the measurement unit and the location of the particle, and wherein the shielding gas is substantially identical to the gas used for fluidizing the particle.

28. (Amended) The apparatus as set forth in claim 24, wherein the fluid supply unit generates a single droplet of the coating fluid which is brought to impinge upon the particle.

29. (Amended) The apparatus as set forth in 28, wherein the fluid supply unit injects each droplet of the coating fluid into the fluidizing gas flow.



30. (Amended) The apparatus as set forth in claim 28, wherein the fluid supply unit repeatedly generates single droplets of the coating fluid and thereby forms a stream of such droplets which sequentially impinge upon the particle.

31. (Amended) The apparatus as set forth in claim 24, further comprising a control unit which monitors at least one control parameter related to the particle or its environment.

32. (Amended) The apparatus as set forth in claim 31, wherein the control unit receives the measurement value from the measurement unit and adjusts the control parameter at least partly on the basis of the measurement value.

33. (Amended) The apparatus as set forth in claim 26, wherein the control unit receives the measurement value from the measurement unit and adjusts the control parameter at least partly on the basis of the measurement value; and wherein the control parameter comprises a property of the fluidizing gas flow, and the control unit adjusts the control parameter by controlling the flow unit.

34. (Amended) The apparatus as set forth in claim 28, wherein the control unit receives the measurement value from the measurement unit and adjusts the control parameter at least partly on the basis of the measurement value; and wherein the control parameter comprises a property of the droplet, and the control unit adjusts the control parameter by controlling the fluid supply unit.

35. (Amended) The apparatus as set forth in claim 28, wherein the control unit receives the measurement value from the measurement unit and adjusts the control parameter at least partly on the basis of the measurement value; and wherein the control parameter comprises the duration of a droplet generation period; and the control unit adjusts the control parameter by controlling the fluid supply unit.

36. (Amended) The apparatus as set forth in claim 28, wherein the control unit receives the measurement value from the measurement unit and adjusts the control parameter at least partly on the basis of the measurement value; and wherein the control parameter comprises the duration of a drying period, and the control unit adjusts the control parameter by controlling the fluid supply unit.

37. (Amended) The apparatus as set forth in any one of claims 24-36 and 49-52, wherein the measurement unit performs the spectrometric measurement by means of near-infrared spectrometry.

38. (Amended) The apparatus as set forth in any one of claims 24-36 and 49-52, wherein the measurement unit performs the spectrometric measurement by means of a spectrometric method based on Raman scattering.

39. (Amended) The apparatus as set forth in any one of claims 24-36 and 49-52, wherein the measurement unit performs the spectrometric measurement by means of a spectrometric method based on absorption in the UV, visible, or infrared (IR) wavelength region, or luminescence or fluorescence emission.

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40. (Amended) The apparatus as set forth in any one of claims 24-36 and 49-52, wherein the measurement unit performs the spectrometric measurement by means of imaging spectrometry.

41. (Amended) The apparatus as set forth in any one of claims 24-36 and 49-52, wherein the particle is a pharmaceutical product.

42. (New) The method as set forth in claim 5, further comprising the steps of:

- a) monitoring at least one control parameter related to the particle or its environment; and
b) identifying a functional relationship between the control parameter and the principal parameter,

wherein the control parameter comprises a property of the gas flow.

43. (New) The method as set forth in claim 10, wherein the property of the gas flow is flow rate, temperature, or solvent content.

44. (New) The method as set forth in claim 42, wherein the property of the gas flow is flow rate, temperature, or solvent content.

45. (New) The method as set forth in claim 11, wherein the property of the particle is size, shape, density, or porosity.

46. (New) The method as set forth in claim 12, wherein the property of the droplet is size, generation rate, or concentration of a constituent.

47. (New) The method as set forth in claim 13, wherein the wetting period is effected by controlling the droplet generation.

48. (New) The method as set forth in claim 20, wherein the pharmaceutical product is a pellet, a tablet, or a capsule.